

**Community Meeting Questions and Answers**  
**Renaissance Center**  
**9/23/2003**

Response to questions received at the Community Meeting in Dickson County on September 23, 2003 by the Division of Solid Waste Management (DSWM), Tennessee Department of Environment and Conservation (TDEC).

- **Is all groundwater in Dickson County contaminated with TCE?**

Not to our knowledge.

- **If not then what areas are contaminated?**

At this time, the areas of identified TCE contamination are the former Holt water wells, Sullivan spring, former DK-21 well, DK-9 located adjacent to the landfill, two monitoring wells installed at the landfill, three water wells located approximately 1.5 miles southwest of the landfill and the area around the old Schrader plant, and downgradient of the Schrader plant to the east.

- **What is the furthest distance that contaminants have been found?**

Approximately 1.5 miles to the southwest of the landfill.

- **How can we be sure the contamination won't spread to these areas in the future?**

While TDEC cannot ensure that contamination won't spread, we are currently working with Dickson County and others to define the extent of groundwater contamination and develop an appropriate management/cleanup strategy(s).

- **Is there any way to clean up contaminated water in our wells?**

Dickson County, working with the Dickson County Water Authority, has provided alternate safe drinking water to those with TCE contaminated well water. If cleanup of contaminated groundwater is required there are several well documented techniques to remove TCE from soil and groundwater. The most common techniques include, but are not limited to:

- Monitored Natural Attenuation
- Enhanced Biodegradation
- Chemical Oxidation
- Permeable Reactive Barriers
- Various Forms of Physical Mass Removal
  - Pump & Treat
  - Gas Venting and/or Sparging

- **Is the land being tested?**

The soil in portions of the landfill was tested, but a soil investigation has not been performed outside the boundaries of the landfill.

- **What about the air?**

The Division of Air Pollution Control is in the process of installing an air monitor in the City of Dickson area. The monitor will be used to sample for air toxics such as toluene and TCE.

- **The water in my well is contaminated. Who is going to pay to have city water hooked up?**

The State of Tennessee, Dickson County and the local water authority will work together to provide water that is safe for household use to residents of Dickson County whose drinking water well or spring has been impacted by TCE.

- **Is grant money available for people needing to hook up to city water?**

Not at this time; however, it is our understanding that Dickson County officials are currently exploring many local, state and federal avenues for obtaining grant funds to provide alternate water supplies in the area of the landfill.

- **Is the City water supply from Piney safe?**

According to the Tennessee Division of Water Supply, the water supply from Piney is safe.

- **Why hasn't anything been done about the contamination until now?**

Dickson County Landfill, as required by the DSWM, has been conducting groundwater monitoring activities from four monitoring wells at the landfill since the late 1980s. TCE contamination was not detected associated with landfill monitoring until 1994 in Sullivan spring. In the effort to evaluate if the landfill was the source of the TCE, groundwater monitoring activities included the installation and sampling of five additional groundwater monitoring wells installed around the perimeter of the landfill, the surveying and sampling of water wells and springs in the area of the landfill, performance of a dye trace study in 1997, conducted by the United States Geologic Survey, sampling of landfill leachate, performance of a geophysical study and subsequent installation of two additional deep groundwater monitoring wells in 2002. The landfill has also been required to install a leachate collection system and a low permeability landfill cap. Treated water has been supplied to water well and spring users whose drinking water sources were identified to be contaminated with TCE. The process of assessing the contamination is on-going, expensive and time-consuming, and made even more complicated by the complex nature of the geology beneath the landfill.

- **There are reports of fuel tanks still existing under the Health Department building where witnesses have seen fuel run-offs into localized ground areas. Comments? Will this be investigated?**

The regulatory authority for the closure and assessment of the fuel tanks at the Health Department Building was overseen by the Division of Underground Storage Tanks. It is our understanding that this site has been investigated and has met the Division's requirements. Information regarding this facility is on file at the Division (615) 532-0945.

- **I would like to have my water tested, to find out if it's good or bad. How can I get it tested?**

Residents of Dickson County whose drinking water source is a private water well or spring can call the Division of Solid Waste Management, 615-532-0780.

- **My neighbors, the Holts and Sullivans, have contaminated wells. I live less than ½ mile from them and they said my well is okay. How is this possible? Can I get my water tested again?**

Due to the geologic nature of fractured limestone, this is not only possible but is characteristic of this type of geology. We are sampling wells on a priority basis. If a well has detectable levels of TCE contamination it will be re-sampled. If not, it will be the homeowner's responsibility to incur the expense of periodic sampling or installing some type of water treatment system on their well.

- **Why would a known contaminated public city well ever be reopened even for just a while?**

The well in question, DK-21, was reopened only after a treatment system was installed that would remove the TCE from the water.

- **What does the county do with the money they get from permits they issue to factories, allowing them to dump waste chemicals into the lakes and streams? How is the money spent?**

Dickson County does not obtain money from permits allowing factories to dump waste chemicals into lakes or streams.

- **How far from the landfill is West Piney Road?**

Depending upon where on West Piney Road, you are located between 0.5 and 2.0 miles from the landfill.

- **How far out are you testing wells?**

To date, most of the sampling has been focused within an approximately three-mile radius of the landfill. As additional information is obtained, the area of investigation will be modified.

- **How many city wells had to be closed because of contamination?**

One municipal water supply well (DK-21) had detectable levels of contamination, and was taken out of service and permanently closed.

- **Where exactly is the well reported to have 51,000 parts per billion of TCE? How many households consumed water from the well?**

The well that had a reported 51,000ppb TCE is a monitoring well located at the Dickson County landfill, between the Old city dump and the Old county landfill. A monitoring well is a specialized well that is installed strictly for obtaining water samples, and would not be utilized for a water supply. Therefore, residents did not consume water from this well.

- **I live two miles from the landfill and have been on city water since the early 80s, and have health problems, is the Piney River water supply okay? Was I getting water from the contaminated well?**

According to the Division of Water Supply, the Piney River is a safe source of drinking water. To the best of Division's knowledge, DK-21 was placed in service in December of

1982. Afterwards, this well was used to supplement the supply from City Lake. When DK-21 was used, it made up 30 and 35 percent of total volume of water being treated at the treatment plant. Water from City Lake made up the rest. The combined water from well DK-21 and City Lake after treatment has been tested numerous times. The tests performed include inorganic chemicals, secondary chemicals, radionuclides, disinfection by-products, lead and copper, volatile organic chemicals and synthetic organic chemicals. All of the results can be reviewed at the Division of Water Supply's office at 401 Church Street or at 711 R. S Gass Blvd in Nashville. The Dickson Water System, now the Water Authority of Dickson County, should also have copies of the sampling results.

- **If my well tests positive for TCE contamination, is bathing and cooking with that water safe?**

According to DSWM's toxicologist, it is best if the water is not used for household use.

- **In 1975 on your key dates on back of the agenda, it was noted that no liquids were allowed to be disposed of. But in 1977 Shrader was dumping trailer loads of liquids, you say. Who let them and why were they not stopped? Was there a deal made?**

According to the key dates on the agenda, in 1975, the landfill was prohibited from taking liquids. Any dumping of liquids after that date would have been illegal dumping. The notation for the 1977 date on the agenda reflect reports from local residents citing incidents of dumping liquids at the landfill during the 1968 thru 1975 time period. We have no knowledge of any deal being made.

- **If we go to city water do we still have to pay a water bill every month?**

This is a question that should be directed to Dickson County officials.

- **Is Turnbull utility being investigated? Is this water supply safe?**

The Division of Water Supply requires periodic sampling of any municipal water supply in Tennessee. According to the Division of Water Supply, the Turnbull water supply is safe.

- **Can TCE spread through the ground, onto our property that is near to the landfill?**

It is unlikely that TCE will spread through the soil onto the surface of your property (ground?); however, TCE may migrate beneath your property (ground) within groundwater.

- **Have any of the industries in the industrial park been cited for improprieties in their waste management? If so, which ones?**

There are currently no outstanding Notices of Violation regarding Dickson county industry.

- **Can the water problems go even further, such as to Charlotte, Tennessee?**

The regional groundwater flow in the area of the landfill is to the southwest, therefore, it is unlikely that contamination from the landfill will affect Charlotte, which is north of the landfill.

- **Are you asking Schrader to clean up the landfill?**

The Dickson County Landfill is under a State Order to assess and remediate the contamination related to the landfill, and they will continue to do so. However, that does not mean that the county cannot file a civil case against Schrader for the cost of the clean-up.

- **When were the wells at the landfill first tested for TCE?**

The landfill monitoring wells were first installed in 1987 and sampled for TCE in 1994.

- **How much TCE did Shrader and others haul to the dump?**

We are unable to determine the precise amount of TCE dumped in the landfill but we believe it to be several thousand gallons.

- **Are any other businesses besides Shrader guilty of dumping Volatile Organic Compounds (VOCs) at the landfill or other dumping sites in Dickson County?**

Yes, there have been reports of other companies disposing of wastes in the landfill and other alleged dump sites in Dickson County. These allegations are currently being investigated and the State asks that if anyone has any knowledge of these activities to contact the Nashville Environmental Assistance Center at 1-888-891-8332.

- **According to state records, testing of well DK-21 showed elevated levels of TCE between December 1996 and April 1997. Do you have any reason to doubt that in 1993 test results showed levels of TCE in 9 wells used by the plaintiffs in a local lawsuit was 184 times the permissible drinking limit of 5 parts per billion?**

No, however that lawsuit is the result of a release of TCE at the old Schrader plant site. That site, historically and currently, is being managed by the U.S. EPA Region 4 in Atlanta GA.

- **If the city water is safe, why are we being switched over to the Cumberland Water system?**

This question should be directed to Dickson County officials.

- **Dye samples of the West Piney River showed traces of anti-freeze at several locations toward the raw water intake on this river. Antifreeze is made of Dipotassium Phosphate, Silicon, Silicate, dyes, Diethylene Glycol, and Ethylene Glycol which causes birth defects. Will these chemicals be added to city water sampling tests? Will city water be tested more often than the present two annual samplings?**

This question should be directed to Dickson County officials.

- **As owner of Sullivan Spring, I was told years ago by the state that it would be cleaned up. My question is when?**

In 1994 the landfill was required by the DSWM to begin assessing the suspected release of TCE contamination. This is an expensive and time consuming process made even more complicated by the complex nature of the geology beneath the landfill. After the contamination is fully assessed, an effort at remediating the groundwater can be performed,

but until the contamination is fully assessed, any remediation of the groundwater would be futile. Contact DSWM at 615-532-0780 to request monitoring results from Sullivan Spring.

- **Until studies are conducted 2-3 years down the road, how can you assure the city drinking water is safe?**

The Division of Water Supply requires all water supplies in Tennessee to be sampled periodically, therefore, the Division of Water Supply assures you that your water is safe.

**Response to questions received at the Community Meeting in Dickson County on September 23, 2003 by the Division of Water Supply (DWS), Tennessee Department of Environment and Conservation (TDEC).**

- **When was DK-21 first activated?**

The drilling of DK-21 was completed on October 20, 1980. To the best of TDEC's knowledge, DK-21 was placed in service in December of 1982. Afterwards this well was used to supplement the supply from City Lake. It is 160 feet deep and cased to 106 feet below land surface with 10 inch black steel casing. The casing was grouted from a depth of 106 to land surface with cement grout. The water-bearing zone was from 126 feet to 143 feet below land surface.

- **Is there an available record showing what dates DK-21 was in use?**

Unfortunately, Division of Water Supply records do not show the timeframes in which DK-21 was in use. This well was used in conjunction with City Lake. Records prior to 1992 provide limited information on the use of DK-21. When DK-21 was used, it made up 30 and 35 percent of total volume of water being treated at the treatment plant. Water from City Lake made up the rest. Detailed records after 1992 are either not available or do not indicate to what extent the source was used.

- **Is the well DK-21 still in operation? If not, when was usage stopped?**

Well DK-21 is no longer in use. It was in use from approximately December 1982 until April 18, 1997 when TCE was detected. The City of Dickson installed an aeration system in early 2000 and used Well DK-21 from March 6, 2000 through March 19, 2000. During this period, water from Well DK-21 passed through an aeration system before being mixed with water from City Lake and undergoing routine treatment. The pump in DK-21 failed on March 19, 2000 and the well has not been used since then.

- **Has this well been tested, and if so, for what constituents and by whom? Where can I obtain a copy of the test results?**

The combined water from well DK-21 and City Lake after treatment has been tested numerous times. The tests performed include inorganic chemicals, secondary chemicals, radionuclides, disinfection by-products, lead and copper, volatile organic chemicals and synthetic organic chemicals. The number of samples taken and test results is extremely large and would be difficult and time consuming to copy. It may be more practical to provide the

information in an electronic format or if the specific dates of concern are known to copy only those records. All of the results can be reviewed at the Division of Water Supply's office at 401 Church Street or at 711 R. S Gass Blvd in Nashville. The Dickson Water System, now the Water Authority of Dickson County, should also have copies of the sampling results.

Attached is a listing of the trichloroethylene results on file with the Division of Water Supply. The earliest sampling showing trichloroethylene results was in 1988 as water systems were not required to sample for trichloroethylene prior to this date. Trichloroethylene was not detected in any sample taken from the Dickson Water System until February 24, 1997. Environmental Science Corporation performed the majority of the analytical work, but did subcontract with Teledyne Isotopes, American Analytical, Triangle Laboratories and Guardian Labs for some of the analytical work.

- **Was the water from DK-21 pre-treated? If so, what was the method used in pre-treatment, and where was the water treated?**

Prior to March 6, 2000, water from DK-21 was not pre-treated prior to mixing with the raw water from City Lake. After the lake and well water were mixed, the water passed through the completed treatment system consisting of a flash mix, coagulation and flocculation, sedimentation, filtration, and disinfection before being pumped from the clearwell to the distribution system.

- **Was the water from this well mixed with other water sources for general distribution by the City of Dickson, or was this water used only for a segment of the population? If so, what were the boundaries of this distribution?**

Water from DK-21 was mixed with the raw water from City Lake. The combined water was processed through the Dickson Water Treatment Plant before being pumped into the general distribution system. Water from DK-21 in combination with City Lake water was not distributed to a specific area of the distribution system but was distributed throughout the entire city distribution system and to the systems that purchased water from the city.

**Response to questions received at the Community Meeting in Dickson County on September 23, 2003 by the Tennessee Department of Health Communicable and Environmental Disease Services.**

- **If livestock (cattle, pigs and chickens) ingests water contaminated with TCE, will the meat and/or eggs from the livestock be contaminated, and would there be adverse health effects from ingesting it?**

Trichloroethylene (TCE) does not build up in plants or animals. Therefore, it is highly unlikely that eating meat, eggs, or milk taken from Dickson County livestock would cause adverse health effects in people.

- **Can TCE cause leukemia or a brain fungus known as Aspergillus?**

There is not clear evidence that TCE alone in drinking water can cause any type of cancer in humans. Some studies have found an association between children who drank TCE polluted water and a higher incidence of childhood leukemia. Leukemia is a malignant cancer of the bone marrow and blood, and like all cancers it involves the uncontrolled growth of abnormal cells. In most cancers, these out-of-control cells form tumors, but in leukemia the problem is with blood cells.

No, TCE does not cause fungal growth. Aspergillus is a group of molds, which are found world-wide, especially in autumn and winter in the United States. The types of illnesses caused by Aspergillus are varied, ranging from allergies to generalized infections.

- **Can TCE cause tumors in pets?**

We did not find any medical studies detailing effects of TCE on pets. Literature indicates that laboratory mice and rats exposed to large amounts of TCE developed tumors in the lungs, liver, and testes.

- **What birth defects are associated with TCE?**

Studies suggest that more birth defects occur when pregnant mothers drink water containing TCE. Several developmental effects were reported in the scientific literature including: heart defects, respiratory defects, eye defects, neural tube defects, and oral cleft palate defects. Children exposed to TCE have been reported to have higher rates of hearing and speech impairment. Many questions still exist as to the exact toxicology of TCE as it relates to health effects such as birth defects.

- **What are the symptoms of exposure to TCE? What are the concentrations and exposure times necessary to cause illness?**

People who breathe large amounts of TCE can become dizzy or sleepy. Unconsciousness can occur when high levels of TCE are breathed in. Skin contact with concentrated TCE can cause rash. Internal effects of TCE include damage to the nervous system, liver, and kidneys. Not enough toxicological information exists to clearly determine if people exposed to TCE are at a greater risk of developing cancer or having reproductive effects. The International Agency for Research on Cancer (IARC) has determined that TCE probably can lead to cancer in humans.

The Environmental Protection Agency has set a drinking water standard of 5 parts of TCE per 1 billion parts of water (5 pbb). This enforceable standard, the maximum contaminant level (MCL), applies to public water systems. The standard is set to protect the health of the general population and sensitive subpopulations.

TCE exposures in the workplace are regulated by the Occupational Safety and Health Administration (OSHA). The occupational exposure limit for an 8-hour workday, 40-hour workweek, is an average concentration of 100 parts per million (ppm) in air. Most people can begin to smell TCE in air at concentrations between 28-100 ppm. The 15-minute

average exposure in air that should not be exceeded at any time during a workday is 300 ppm. The OSHA standards are based on preventing central nervous systems effects after exposure to TCE. (100 ppm is the same as 100,000 ppb.)

Note that the amounts of TCE measured in groundwater wells in Dickson County are not considered to be high concentrations. The amount of TCE measured within the Dickson County Landfill is considered to be a high concentration.

- **Can TCE cause toxemia?**

There is no evidence that TCE causes toxemia. Toxemia, also known as pre-eclampsia, is diagnosed in about 7% of all pregnancies. Symptoms include high blood pressure, protein in the urine and swelling of the body (edema). Toxemia is more likely for: women giving birth for the first time; women with certain medical conditions, such as pre-existing high blood pressure, diabetes and obesity; or women having twins. Toxemia typically arises after the 20th week of pregnancy.

- **Can human blood be tested to analyze for the presence and concentration of TCE?**

If you were recently exposed, levels of TCE can be measured in your breath. If you were exposed to large amounts of TCE, breakdown products can be measured in your blood and urine within one week of exposure.

- **Can TCE cause diabetes?**

There is no evidence of an association between TCE and diabetes in scientific literature.

- **Can TCE cause heart problems?**

There is evidence in both human and animal studies that TCE exposure can increase the risk of improper fetal heart development. At high levels of TCE exposure, changes in heart beat have been reported.

- **Can TCE cause sleep apnea?**

No connection between TCE exposure and sleep apnea has been reported in scientific literature. Sleep apnea is a condition that occurs when a person regularly stops breathing for 10 seconds or longer during sleep. It is a form of sleep-disordered breathing. In 1983, a causal relationship between trichloroethane (TCA), a chemical similar to trichloroethylene (TCE), and sleep apnea was reported. A man who breathed TCA in a typewriter repair shop for about 20 hours a day over three years experienced sleep apnea. His sleep apnea symptoms disappeared after the trichloroethane exposure stopped.

- **Would an illness profile of one family's exposure to TCE be similar to other families, which were exposed over an extended period of time?**

If you are exposed to TCE, many factors will determine whether you will be harmed. These factors include the dose (how much), the duration (how long), and how you come in contact with it. You must also consider the other chemicals you are exposed to and your age, gender, diet, family traits, lifestyle, and state of health. Studies have shown that high amounts of

TCE can affect the nervous system, liver, and kidneys. Therefore, one would expect illnesses relating to these organs to recur if the TCE exposure scenarios were similar. Comparisons of other illnesses related to TCE exposure between one family and another would be difficult to validate.

Many of the questions were answered with literature summarized in *Toxicological Profile for Trichloroethylene* published in September 1997. This document was prepared in accordance with guidelines developed by the Agency for Toxic Substances and Disease Registry (ATSDR) and the Environmental Protection Agency (EPA). Additional information on environmental public health can be read on their respective Internet sites at [www.atsdr.cdc.gov](http://www.atsdr.cdc.gov) and [www.epa.gov](http://www.epa.gov). The complete *Toxicological Profile for Trichloroethylene* can be view at <http://www.atsdr.cdc.gov/toxprofiles/tp19.html>.

Additional environmental public health questions, concerns or inquires can be directed to: Tennessee Department of Health; Communicable and Environmental Disease Services (CEDS); 4th Floor Cordell Hull Bldg; 425 5th Avenue North; Nashville TN 37247-4911; (615) 741-7247 phone; (615) 741-3857 fax; [www2.state.tn.us/health/ceds](http://www2.state.tn.us/health/ceds).

Additional environmental and public health questions, concerns or inquiries can be directed to:

Tennessee Department of Environment and Conservation  
Division of Solid Waste Management  
5<sup>th</sup> Floor, L & C Tower  
401 Church Street  
Nashville, TN 37243-1535  
(615) 532-0780 (phone) – (615) 532-0886 (fax)  
e-mail Solid.Waste@state.tn.us  
[www.state.tn.us/environment/swm](http://www.state.tn.us/environment/swm)

Tennessee Department of Environment and Conservation  
Division of Water Supply  
6<sup>th</sup> Floor, L & C Tower  
401 Church Street  
Nashville, TN 37243  
(615) 687-7000 (phone) – (615) 687-7078 (fax)  
e-mail Water.Supply@state.tn.us  
[www.state.tn.us/environment/dws](http://www.state.tn.us/environment/dws)

Tennessee Department of Health  
Communicable and Environmental Disease Services (CEDS)  
4th Floor Cordell Hull Bldg  
425 5th Avenue North  
Nashville TN 37247-4911  
(615) 741-7247 phone; (615) 741-3857 fax  
[www2.state.tn.us/health/ceds](http://www2.state.tn.us/health/ceds)

## Listing of the trichloroethylene results on file with the Division of Water Supply for the Dickson Water System

<u>Sampling Date</u>	<u>Sample Location</u>	<u>TCE Results</u>
02-11-88	Ent Pt – No Source Listed	N/D
05-11-88	Ent Pt – No Source Listed	N/D
08-22-88	Ent Pt – No Source Listed	N/D
08-23-88	Ent Pt – No Source Listed	N/D
08-24-88	Ent Pt – No Source Listed	N/D
12-04-88	Ent Pt – No Source Listed	N/D
12-05-88	Ent Pt – No Source Listed	N/D
12-07-88	Ent Pt – No Source Listed	N/D
02-11-91	Ent Pt – No Source Listed Surface	N/D
02-12-91	Ent Pt – Ground (well)	N/D
02-13-91	Ent Pt – Piney River	N/D
05-21-91	Ent Pt – City Lake	N/D
06-25-91	Ent Pt – Piney River	N/D
07-31-91	Ent Pt – City Lake	N/D
08-20-91	Ent Pt – Piney River	N/D
11-04-91	Ent Pt – Piney River	N/D
12-16-91	Ent Pt – City Lake	N/D
04-20-93	Ent Pt - City Lake/Well	N/D
04-21-93	Ent Pt – Piney River	N/D
08-02-94	Ent Pt – Piney River	N/D
10-12-94	Ent Pt – City Lake/Well	N/D
12-26-94	Ent Pt – Lake	N/D
04-10-95	Ent Pt – No Source Listed	N/D
05-08-95	Ent Pt – Piney River	N/D
10-01-96	Ent PT – Piney River	N/D
12-09-96	Ent Pt – City Lake/Well	N/D*
*Detected Dichloromethane @ 0.9 ppb in 12-09-96 sample		
02-24-97	Ent Pt – City Lake/Well	1.3 ppb
04-07-97	Ent Pt – City Lake/Well	2.1 ppb**
**Well shut down on 04-18-97		
04-21-97	125 Pond Rd	N/D
04-21-97	DK-21 Well – Raw Water	32 ppb
04-21-97	125 Robinson Rd	N/D
04-21-97	City Lake – Raw Water	N/D
08-19-97	Ent Pt – No Source Listed	N/D
03-16-98	Ent Pt – No Source Listed	N/D
03-24-98	City Lake – Raw Water	N/D
04-07-99	Ent Pt – No Source Listed	N/D
12-08-99	Ent Pt – No Source Listed	N/D
05-01-00	Ent Pt – City Lake	N/D
06-13-00	Ent Pt – No Source Listed	N/D
12-05-00	Ent Pt – City Lake	N/D
01-23-01	Ent Pt – No Source Listed	N/D
05-22-01	Ent Pt – No Source Listed	N/D
06-13-01	Ent Pt – No Source Listed	N/D

Ent Pt – Sample taken at the entry point to the distribution system at the water treatment plant.

N/D – No Detection at the method detection limit (less than 0.5 ppb).

ppb – parts per billion